

WHAT IS CLAIMED IS:

1. An end effector apparatus comprising:

a deflecting mechanism having a proximal portion, a distal portion, and a redirection mechanism between the proximal portion and the distal portion, the redirection mechanism configured to allow the distal portion to be redirected relative to the proximal portion;

an end effector assembly coupled to the distal portion; and

a first actuator coupled to the deflecting mechanism to redirect the distal portion with respect to the proximal portion via the redirection mechanism.
2. The apparatus of claim 1, wherein the first actuator is a wire.
3. The apparatus of claim 2, wherein the wire extends through a lumen defined by the deflecting mechanism.
4. The apparatus of claim 2, wherein the wire is coupled to the distal portion.
5. The apparatus of claim 3, wherein the deflecting mechanism defines a proximal opening and a side gap; and

wherein the wire extends through the proximal opening and selectively extends through the side gap.
6. The apparatus of claim 3, wherein the wire is coupled to the deflecting mechanism to allow the wire to move within the lumen.
7. The apparatus of claim 2, wherein the wire selectively extends through a gap defined by a side portion of the deflecting mechanism.

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8. The apparatus of claim 1, further comprising a second actuator coupled to the end effector assembly to actuate the end effector assembly.

9. The apparatus of claim 8, wherein the second actuator is a wire.

10. The apparatus of claim 9, wherein the wire extends through a lumen defined by the deflecting mechanism.

11. The apparatus of claim 10, wherein the deflecting mechanism defines a proximal opening and a side gap; and

wherein the wire extends through the proximal opening and selectively extends through the side gap.

12. The apparatus of claim 10, wherein the wire is coupled to the deflecting mechanism to allow the wire to move within the lumen.

13. The apparatus of claim 9, wherein the wire selectively extends through a gap defined by a side portion of the deflecting mechanism.

14. The apparatus of claim 1, wherein the redirection mechanism comprises a pivot configured such that the distal portion pivots relative to the proximal portion.

15. The apparatus of claim 14, wherein the pivot includes at least one pin extending through holes defined by the proximal and distal portions.

16. The apparatus of claim 1, wherein the end effector assembly includes a grasper.

17. The apparatus of claim 1, wherein the end effector assembly includes a medical device.

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18. The apparatus of claim 9, wherein the end effector assembly includes links, the end effector being connected to the links.

19. The apparatus of claim 1, wherein the deflecting mechanism is configured to allow the distal portion to be redirected up to at least 90 degrees relative to an axis of the proximal portion.

20. The apparatus of claim 1, wherein the deflecting mechanism is configured to allow the distal portion to be redirected from a first position where a longitudinal axis of the distal portion is substantially collinear with a longitudinal axis of the proximal portion, to a second position where the longitudinal axis of the distal portion is not substantially collinear with the longitudinal axis of the proximal portion.

21. The apparatus of claim 1, wherein the deflecting mechanism is configured to allow the distal portion to be redirected in only one direction relative to the proximal portion.

22. The apparatus of claim 1, wherein the end effector assembly is configured to receive a current.

23. An endoscopic medical device, comprising:

an end effector assembly;

a deflecting mechanism coupled to the end effector assembly, the deflecting mechanism including a proximal portion, a distal portion, and a pivot portion connecting the proximal portion to the distal portion, the pivot portion configured to allow the distal portion to deflect relative to the proximal portion;

a handle;

an elongate member connecting the handle to the deflecting mechanism;

an actuator wire extending through the elongate member and connecting the handle to the end effector assembly; and

a deflector wire extending through the elongate member and connecting the handle to the deflecting mechanism,

wherein the handle is configured to control the end effector assembly via the actuator wire and the deflecting mechanism via the deflector wire.

24. The apparatus of claim 23, further comprising a second actuator wire extending through the elongate member and connecting the handle to the end effector assembly.

25. The apparatus of claim 23, wherein the actuator wire is configured to deliver a current from the handle to the end effector assembly.

26. The apparatus of claim 23, wherein the deflector wire is coupled to a deflection handle on the handle such that manipulation of the deflection handle deflects the distal portion.

27. The apparatus of claim 23, wherein the handle comprises:
a central shaft; and
a deflection handle disposed around and slideable along the central shaft;
wherein the deflector wire is coupled to a deflection handle on the handle portion such that sliding the deflection handle along the central shaft deflects the distal portion.

28. The apparatus of claim 23, wherein the actuator wire is coupled to an actuation handle on the handle portion such that manipulation of the actuation handle actuates the end effector assembly.

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29. The apparatus of claim 27, wherein the handle comprises an actuation handle disposed around and slideable along the central shaft, wherein the actuator wire is coupled to the actuation handle such that sliding the actuation handle along the central shaft actuates the end effector assembly.

30. The apparatus of claim 23, wherein the end effector assembly includes a grasper.

31. The apparatus of claim 23, wherein the end effector assembly includes a medical device.

32. The apparatus of claim 23, wherein the deflector wire extends through a lumen defined by the deflecting mechanism.

33. The apparatus of claim 23, wherein the deflector wire is coupled to the distal portion.

34. The apparatus of claim 32, wherein the deflecting mechanism defines a proximal opening and a side gap; and

wherein the deflector wire extends through the proximal opening and selectively extends through the side gap.

35. The apparatus of claim 32, wherein the deflector wire is coupled to the deflecting mechanism to allow the wire to move within the lumen.

36. The apparatus of claim 23, wherein the deflector wire selectively extends through a gap defined by a side portion of the deflecting mechanism.

37. The apparatus of claim 23, wherein the actuator wire extends through a lumen defined by the deflecting mechanism.

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38. The apparatus of claim 37, wherein the deflecting mechanism defines a proximal opening and a side gap; and

wherein the actuator wire extends through the proximal opening and selectively extends through the side gap.

39. The apparatus of claim 37, wherein the actuator wire is coupled to the deflecting mechanism to allow the wire to move within the lumen.

40. The apparatus of claim 23, wherein the actuator wire selectively extends through a gap defined by a side portion of the deflecting mechanism.

41. The apparatus of claim 23, wherein the pivot portion is configured such that the distal portion pivots relative to the proximal portion.

42. The apparatus of claim 23, wherein the pivot portion includes at least one pin extending through holes defined by the proximal and distal portions.

43. The apparatus of claim 23, wherein the deflecting mechanism is configured to allow the distal portion to be deflected up to at least 90 degrees relative to an axis of the proximal portion.

44. The apparatus of claim 23, wherein the deflecting mechanism is configured to allow the distal portion to be deflected from a first position where a longitudinal axis of the distal portion is substantially collinear with a longitudinal axis of the proximal portion, to a second position where the longitudinal axis of the distal portion is not substantially collinear with the longitudinal axis of the proximal portion.

45. The apparatus of claim 23, wherein the deflecting mechanism is configured to allow the distal portion to be deflected in only one direction relative to the proximal portion.

46. A method of performing a procedure with an end effector apparatus, comprising:

providing a distal end effector assembly coupled to an elongate member in a substantially straight configuration;

redirecting the distal end effector assembly such that the distal end effector assembly and the elongate member are no longer in a substantially straight configuration; and

actuating the distal end effector assembly to perform the procedure.

47. The method of claim 46, further comprising providing a current to the distal end effector.

48. The method of claim 46, wherein redirecting the distal end effector assembly includes moving a wire within a lumen defined by the distal end effector assembly and the elongate member.

49. The method of claim 46, wherein the distal end effector assembly includes a deflecting mechanism having a proximal portion fixedly coupled to the elongate member and a distal portion coupled to the end effector assembly, and

wherein redirecting the distal end effector assembly includes redirecting the distal portion relative to the proximal portion.

50. The method of claim 49, wherein redirecting the distal end effector assembly includes moving a wire through a gap defined by a side portion of the deflecting mechanism.

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51. The method of claim 46, wherein actuating the distal end effector assembly includes moving a wire within a lumen defined by the distal end effector assembly and the elongate member.

52. The method of claim 49, wherein actuating the distal end effector assembly includes moving a wire extending through a gap defined by a side portion of the deflecting mechanism.

53. The method of claim 46, further comprising returning the distal end effector assembly and the elongate member to the substantially straight configuration.

54. The method of claim 46, wherein redirecting the distal end effector assembly comprises pivoting the distal end effector assembly relative to the elongate member.

55. The method of claim 46, wherein the distal end effector assembly is redirected such that a longitudinal axis of the distal end effector assembly and a longitudinal axis of the elongate member are substantially perpendicular to each other.

56. The method of claim 46, wherein redirecting the distal end effector assembly includes manipulating a handle and actuating the distal end effector assembly includes manipulating the handle.

57. The method of claim 56, wherein the handle comprises a central shaft, a deflection handle disposed around the central shaft, and an actuation handle disposed around the central shaft, and

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wherein redirecting the distal end effector assembly includes sliding the deflection handle along the central shaft and actuating the distal end effector assembly includes sliding the actuation handle along the central shaft.

58. The method of claim 49, wherein the distal portion is redirected relative to the proximal portion via a pivot portion.

59. The method of claim 58, wherein the pivot portion includes at least one pin extending through holes defined by the proximal and distal portions.

60. An endoscopic medical procedure, comprising:

providing an endoscopic medical device having an elongate member with a redirecting mechanism and an end effector assembly at a distal end of the elongate member;

with the redirecting mechanism in a substantially straight configuration, advancing the elongate member into a body lumen until the distal end is proximate a treatment site,

redirecting the redirecting mechanism such that the redirecting mechanism is no longer in the substantially straight configuration to position the end effector assembly toward the treatment site;

actuating the end effector assembly to perform a medical procedure; and

returning the redirecting mechanism to the substantially straight configuration.

61. The method of claim 60, wherein the medical procedure includes applying a current to the treatment site via the end effector assembly.

62. The method of claim 60, wherein redirecting the redirecting mechanism includes moving a wire within a lumen defined by the redirecting mechanism.

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63. The method of claim 60, wherein the redirecting mechanism includes a proximal portion fixedly coupled to the elongate member and a distal portion coupled to the end effector assembly, and

wherein redirecting the redirecting mechanism includes redirecting the distal portion relative to the proximal portion.

64. The method of claim 60, redirecting the redirecting mechanism includes moving a wire through a gap defined by a side portion of the redirecting mechanism

65. The method of claim 60, wherein actuating the end effector assembly includes moving a wire within a lumen defined by the redirecting mechanism.

66. The method of claim 60, wherein actuating the end effector assembly includes moving a wire extending through a gap defined by a side portion of the redirecting mechanism.

67. The method of claim 60, further comprising returning the redirecting mechanism to the substantially straight configuration.

68. The method of claim 60, wherein redirecting the redirecting mechanism includes pivoting the redirecting mechanism relative to the elongate member.

69. The method of claim 60, wherein the redirecting mechanism is redirected such that a longitudinal axis of the end effector assembly and a longitudinal axis of the elongate member are substantially perpendicular to each other.

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70. The method of claim 60, wherein redirecting the redirecting mechanism includes manipulating a handle and actuating the redirecting mechanism includes manipulating the handle.

71. The method of claim 70, wherein the handle comprises a deflection handle disposed around the central shaft, and an actuation handle disposed around the central shaft, and

wherein redirecting the redirecting mechanism includes sliding the deflection handle along the central shaft and actuating the end effector assembly includes sliding the actuation handle along the central shaft.

72. The method of claim 63, wherein the distal portion is redirected relative to the proximal portion via a pivot portion.

73. The method of claim 72, wherein the pivot portion includes at least one pin extending through holes defined by the proximal and distal portions.

74. The method of claim 60, further comprising advancing a full thickness resection device into the body lumen.

75. The method of claim 74, wherein the medical procedure includes grasping tissue, and further comprising bringing the grasped tissue into the full thickness resection device.

76. The method of claim 75, further comprising cutting the grasped tissue with the full thickness resection device.

77. The method of claim 76, further comprising connecting tissue with the full thickness resection device.

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78. The method of claim 60, wherein actuating the end effector assembly includes grasping tissue with the end effector assembly.

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